EDITORIAL

Insulin pump therapy before conception improves metabolic control in early pregnancy in women with type 1 diabetes

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The estimated number of diabetes patients amounts to more than 21 million worldwide and is still growing. Diabetes is the most common metabolic disease complicating pregnancy. The rate of pregnancies complicated by diabetes is rising, reflecting an increase in the prevalence of both type 1 and type 2 diabetes as a consequence of the obesity epidemic and increasing maternal age.

The effect of maternal hyperglycemia on fetal development and pregnancy outcome is well known. Regardless of the type of diabetes, hyperglycemia during pregnancy increases the risk of maternal and perinatal adverse outcomes. This has considerable implications because preexisting diabetes (both type 1 and type 2) is associated with a range of pregnancy complications including increased risk of macrosomia, congenital anomaly, delivery by the Caesarean section, and stillbirth.

It was demonstrated nearly 20 years ago that tight control of glycemia and comprehensive care from preconception to delivery improves pregnancy outcomes in women with type 1 diabetes.[1] The comprehensive care of management of hyperglycemia in diabetic women before and during pregnancy is complex and involves a team of healthcare professionals—doctors, nurses, dietitians, and educators. It is crucial to achieve near-normal glucose levels before and during pregnancy. The treatment goal in pregnancies complicated by diabetes is to mimic the patterns of glycemia in normal pregnancy. The guidelines for the management of diabetes and its complications from preconception to postnatal period recommends tight target glucose levels and maintain near-normal levels of hemoglobin A_{1c} (HbA_{1c}) below 43 mmol/mol (6.1%).[2-4]

Gutaj et al.[5] investigated metabolic control in women with type 1 diabetes in early pregnancy depending on the type of insulin treatment. They used the data from the Department of Obstetrics and Women's Diseases, Gynecologic and Obstetrical University Hospital in Poznań, Poland. The department is the biggest perinatal center for pregnant women with diabetes in Poland. All pregnant women with diabetes from the region are immediately referred to the center once the pregnancy is confirmed.

Gutaj et al.[5] compared the metabolic characteristics of type 1 diabetes women in the first trimester of pregnancy, who used different types of insulin therapy: multiple insulin injections (MDIs) or continuous subcutaneous insulin infusion (CSII). This observational study included a total of 168 women. The authors aimed to investigate whether women using CSII before pregnancy achieved better metabolic control in early pregnancy. The duration of CSII therapy before pregnancy was 33 months (range, 6–96 months). The authors reported that only 60.6% of women on CSII and 45.2% of those on MDI received preconception care. Nonetheless, they demonstrated that CSII treatment had beneficial effects not only in terms of the reduction in HbA_{1c} levels but also in a broader metabolic context in early pregnancy. They also highlighted the impact of prepregnancy body mass index on early pregnancy and the differences between the two treatment methods.

There is a paucity of data on the risks of fetal and infant complications, and the contribution of glucose control and other clinical and sociodemographic factors has been poorly described in Polish diabetic women. The study by Gutaj et al.[5] is one of the first studies in Poland involving women with type 1 diabetes followed up from early pregnancy and receiving comprehensive care.

There are a number of studies that have described the continuous association between first-trimester HbA_{1c} levels and the risk of fetal

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Received: May 18, 2015.
Revision accepted: May 19, 2015.
Conflict of interests: none declared.
Pol Arch Med Wewn. 2015; 125 (5): 317-318

and/or infant death.[6-9] Nielsen et al.[8] demonstrated an approximately linear association between first-trimester HbA_{1c} levels exceeding 53 mmol/mol (7%) and the risk of an adverse outcome.[8,9]

We need more information about the potential effect of treatment methods on the whole pregnancy period and infant development. While hyperglycemia in pregnancy represents a significant impact on health resources, there is still no evidence which tools or technologies are better and safer for achieving normoglycemia.

One of the limitations of the study performed by Gutaj et al.[5] is the small number of studied patients. Moreover, the study lacks complete data on the characteristics of women before a planned pregnancy. Effective preconception counseling and more aggressive therapeutic targets in diabetic women, especially before conception, are crucial for the prevention of fetal macrosomia and poor pregnancy outcomes. The study addresses the importance of comprehensive care and educational program to achieve glycemic goals in type 1 diabetic women and shows useful tools for identifying patients who need education. Over 20 years after the St. Vincent Declaration, women with diabetes are still at an increased risk of fetal and infant death. Fewer than half of the women with preexisting diabetes receive preconception care in Poland. To achieve any reduction in poor pregnancy outcomes in this patient group, women should be educated about the benefits of preconception care. The results reported by Gutaj et al.[5] strongly support the need for achieving good glycemic control before pregnancy.

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